



## **CERTIFICATE OF TRANSLATION**

**Re: Taiwanese Patent Application No. 89211576, Filed on July 5, 2000.**

**I, Yuchia Kuo of TOP TEAM INTERNATIONAL PATENT & TRADEMARK OFFICE located at 3<sup>rd</sup> Fl., No.279, Sec.4, Hsin-Yi Rd., Taipei, Taiwan, R.O.C., hereby declare that I am the translator of the document attached and certify that the following is a true and accurate translation of the priority document to the best of my knowledge and belief.**

**Signature of Translator**

A handwritten signature in cursive script, appearing to read "Yuchia Kuo", written over a horizontal line.

**Yuchia Kuo**

**Dated this 10<sup>th</sup> day of December, 2004**

# Utility Model Patent Specification

Title	Collapsible Keyboard	
Inventors	Name	(1) Chien-Shih HSU
		(2) Chin-Cheng LI
		(3) Mao-Sung HUANG
	Nationality	(1) Taiwan, R.O.C.
		(2) Taiwan, R.O.C.
		(3) Taiwan, R.O.C.
	Address	(1) No. 36, Sec. 3, Heping W. Rd., Wanhua Chiu, Taipei, Taiwan 108, R.O.C.
		(2) 4F, No. 15, Lane 37, Chang-Ching St., Hsin-Chuang City, Taipei Hsien, Taiwan, R.O.C.
		(3) No. 250, Sec. 3, Yuan-Lu Rd., His-Hu Chen, Chang-Hua Hsien, Taiwan, R.O.C.
Applicant	Name	Darfon Electronics Corp.
	Address	No. 106, Feng-Shu Tsuen, Kweishan, Taoyuan 333, Taiwan, R.O.C.
	Representative	Kun-Yao Lee



**TITLE**  
**COLLAPSIBLE KEYBOARD**

**ABSTRACT OF THE DISCLOSURE**

5           A collapsible keyboard includes a keyboard base, at least one section hinge, a key base, at least one fixed hinge, at least one movable hinge and a plurality of keys. The keyboard base has a plurality of first sections. The section hinge connects the plurality of first sections so that the first sections are  
10           rotatable with respect to each other. The key base has a plurality of second sections provided on the first sections. The fixed hinge connects the second sections so that they are rotatable with respect to each other. The movable hinge connects one of the first sections and one of the second sections. The  
15           keys are provided on the second sections.

**BACKGROUND OF THE INVENTION**

**Field of the Invention**

20           The present invention relates in general to a collapsible keyboard that can be folded into a reduced size, facilitating transport.

**Description of the Related Art**

25           Generally, characters and symbols are input into a computer via a keyboard. Other input equipment such as mouse pointers or light pens fail to offer input speed and ease to match the keyboard. Therefore, the popularity of keyboards remains universal.

30           A conventional keyboard has a keyboard base, a key base and a plurality of keys. The key base is mounted on the keyboard

base, while the keys are mounted on the key base. The user inputs data into the computer by typing the keys of the keyboard. Operation of the computer using the keyboard is easy and fast. Conventional keyboards are, however, too long to allow easy transport.

### SUMMARY OF THE INVENTION

An object of the present invention is to provide a collapsible keyboard that can be folded into a reduced size, facilitating transport.

The keyboard of the present invention includes a keyboard base, at least one hinge, a key base, at least one fixed hinge, at least one movable hinge and a plurality of keys. The keyboard base has a plurality of first sections. The hinge connects the plurality of first sections so that the first sections are rotatable with respect to each other. The key base has a plurality of second sections provided on the first sections. The fixed hinge connects the second hinges so that the second sections are rotatable with respect to each other. The movable hinge connects one of the first sections and one of the second sections. The keys are provided on the second sections.

When the keyboard is not in use, each section can be rotated by the hinge such that each section is closed together, reducing the size of the keyboard and facilitating transport.

The keyboard in use has a longitudinal size equal to that of a conventional keyboard to comply with user habits. When the keyboard is not in use, the user can fold the keyboard so that the keyboard has a reduced size and easily carried.

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a front view of a collapsible keyboard in accordance with a first embodiment of the present invention;

Fig. 2 depicts the collapsible keyboard of the first embodiment in a folding operation;

Fig. 3 is a local enlarged view of Fig. 1;

Fig. 4 is a local enlarged view of Fig. 2;

Fig. 5 is another local enlarged view of Fig. 2;

Fig. 6 depicts the collapsible keyboard of the first embodiment of the present invention, folded into a reduced size;

Fig. 7 is a front view of a collapsible keyboard in accordance with a second embodiment of the present invention;

Fig. 8 depicts the collapsible keyboard of the second embodiment of the present invention, folded into a reduced size;

Fig. 9 is a front view of a collapsible keyboard in accordance with a third embodiment of the present invention;

Fig. 10 depicts the collapsible keyboard of the third embodiment in a folding operation;

Fig. 11 is a local enlarged view of Fig. 10;

Fig. 12 is another local enlarged view of Fig. 10;

Fig. 13 depicts the connecting rod of Fig. 12;

Fig. 14 depicts the collapsible keyboard of the third embodiment of the present invention, folded into a reduced size;

Fig. 15 is a front view of a collapsible keyboard in accordance with a fourth embodiment of the present invention;

Fig. 16 depicts the collapsible keyboard of the fourth embodiment of the present invention, folded into a reduced size.

**SYMBOLS**

11,12,13,14',15,15',16,16'~ keyboard-base sections

5 18 ~ groove

21,23,24,24',26,26'~key-base sections

31,33,34,34',36,36'~keys

40,42~ hinge

43,44~connecting rod

10 45~movable hinge

48~hinge

51,52,53,54,54',55,55',56,56'~keybaord-base section

61,63,64,64',66,66'~key-base sections

71,73,74,74',76,76'~keys

15 83,84~groove

91,92,93,94,95~hinge

97,98~movable hinge

99,971~pivot

972~connecting rods

20 973~pivot

974~gap

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

25 Please refer to the above figures for the following preferred embodiments of the present invention.

Referring to Figs. 1 and 2, a collapsible keyboard of a first embodiment of the present invention includes a keyboard base, a key base mounted on the keyboard base and a plurality of keys mounted on the key base. The keyboard base has a plurality of sections 11, 12, 13, 14, 15, 16 connected by hinges,

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while the key base has a plurality of sections 21, 23, 24, 26 also connected by hinges. The keyboard can be folded via the hinges, and the detail is introduced later. The keys 31, 33, 34, 36 are mounted on the sections 21, 23, 24, 26 of the key base.  
5 The user types the keys to output corresponding signals to a computer (not shown).

The hinge structure of the keyboard base and key base are described hereinafter. Now referring to Fig. 3, the sections 13, 14 of the keyboard base are connected by a hinge 41 so that  
10 the keyboard can be folded in the middle. Also, the sections 23, 24 of the key base are fixed to the sections 13, 14 of the keyboard base, respectively.

As shown in Fig. 2 again, it is noted that the keyboard of the present invention has two halves, which are the same  
15 (symmetrical). For easy description, only the right half of the keyboard is introduced. Referring back to Fig. 2, the section 26 has an end connected to a fixed hinge 40 (Fig. 4) and the other end connected to a movable hinge 45 (Fig. 5). Referring to Fig. 4, the sections 14, 15 of the keyboard base are connected via  
20 a hinge 48. The section 24 of the key base is fixed to the section 14 of the keyboard base, while the section 26 of the key base is put on the section 15 of the keyboard base. The sections 24, 26 of the key base are connected via the hinge 40. The hinge 40 includes two connecting rods 43, 44 and a pivot 42. The  
25 connecting rods 43, 44 raise the pivot 42 to avoid contact between the keys 34, 36 when the keyboard is folded. Note that the hinge 40 is a fixed hinge. Fig. 5 is another local enlarged view of the movable hinge 56 at another end of the section 26. Referring to Fig. 5, the section 16 of the keyboard base has a  
30 groove 18 to receive the movable hinge 45. The movable hinge

45 connects the section 26 of the key base and the section 16 of the keyboard base. When the keyboard is folded, the hinge 45 moves in the groove 18.

When the keyboard is in use, the keyboard is open and has a longitudinal size equal to that of a conventional keyboard to comply with user habits, as shown in Fig. 1. To fold the keyboard, the user simultaneously rotates the keyboard in directions A, B, C, D until the sections of the keyboard base contact with each other. As shown in Fig. 6, the longitudinal size of the keyboard is reduced by 75%. It is thus convenient for the user to carry the folded keyboard.

Referring to Fig. 7, a collapsible keyboard of a second embodiment of the present invention includes a keyboard base, a key base mounted on the keyboard base and a plurality of keys mounted on the key base. The keyboard base has a plurality of sections 14', 15', 16' connected by hinges, while the key base has a plurality of sections 24', 26' connected by other hinges so that the keyboard can be folded. The keys 34', 36' are mounted on the sections 24', 26' of the key base. The user types the keys to output corresponding signals to a computer (not shown). It is noted that the keyboard of the second embodiment is exactly the same as the right half of the keyboard of the first embodiment. Referring to Fig. 8, the longitudinal size of the keyboard is reduced by 50% when the keyboard is folded.

In the above embodiments, the section 26 or 26' of the key base has an end connected to a fixed hinge and the other end connected to a movable hinge. As well, both ends of the section 26 or 26' are connected to movable hinges. Referring to Figs. 9 and 10, a collapsible keyboard of a third embodiment is shown. A keyboard base has a plurality of sections 51, 52, 53, 54, 55,



56 connected by hinges 91, 92, 93, 94, 95. A key base has a plurality of sections 61, 63, 64, 66, with the keys 71, 73, 74, 76 mounted thereon. The user types the keys to output corresponding signals to a computer.

5       The hinge structure of the keyboard-base sections and the key-base sections of the keyboard are described hereinafter. The keyboard-sections 51, 52, 53, 54, 55, 56 are connected by the hinges 91, 92, 93, 94, 95, respectively. The middle sections 63, 64 of the key base are fixed on the sections 53, 54 of the  
10       keyboard base. The left section 61 of the key base is put on the sections 51, 52 of the keyboard base. The right section 66 of the key base is put on the sections 55, 56 of the keyboard base. The keyboard of the third embodiment is symmetrical. For easy description, only the right half of the keyboard is  
15       introduced. The sections 54, 56 of the keyboard base have grooves 83, 84 thereon, while both ends of the section 66 of the key base are connected to movable hinges 97, 98 (Figs. 11 and 12). Referring to Fig. 11, an enlarged view of the movable hinge 98 is shown. The movable hinge 98 is disposed in the groove 84  
20       to connect the section 66 of the key base and the section 56 of the keyboard base. When the keyboard is folded, the hinge 98 moves in the groove 84. Referring to Fig. 12, an enlarged view of the movable hinge 97 is shown. The movable hinge 97 includes a connecting rod 972 and two pivots 971, 973. The pivot 971 is  
25       movably disposed in the groove 83, while the pivot 973 pivots the connecting rod 972 to the section 66 of the key base. Referring to Fig. 13, Fig. 13 depicts the connecting rod 972. The pivot 973 has a gap 974 so that the pivot 973 can be compressed and fitted into the section 66 of the key base. Then, the

connecting rod 972 is rotatable with respect to the section 66 of the key base and the section 54 of the keyboard base.

Moreover, it is understood that the pivots 971 and 973 can be replaced with each other. That is, the pivot 973 having the gap 974 is disposed in the groove 83, and the pivot 971 is connected to the section 66 of the key base, such an arrangement also providing the same result.

To fold the keyboard, the user simultaneously rotates the keyboard in directions A, B, C, D until the sections of the key base and keyboard base contact with each other. As shown in Fig. 14, the longitudinal size of the keyboard is reduced by 75%. It is convenient for the user to carry the folded keyboard.

Referring to Fig. 15, a collapsible keyboard of a fourth embodiment of the present invention includes a keyboard base, a key base mounted on the keyboard base and a plurality of keys mounted on the key base. The keyboard base has a plurality of sections 54', 55', 56' connected by hinges, while the key base has a plurality of sections 64', 66' connected by other hinges so that the keyboard can be folded. The keys 74', 76' are mounted on the sections 64', 66' of the key base. The user types the keys to output corresponding signals to a computer (not shown). It is noted that the keyboard of the fourth embodiment is exactly the same as the right half of the keyboard of the third embodiment. Referring to Fig. 16, the longitudinal size of the keyboard is reduced by 50% when the keyboard is folded.

In conclusion, the present invention provides a collapsible keyboard. The keyboard in use has a longitudinal size equal to that of a conventional keyboard to comply with user habits. When the keyboard is not in use, the user can fold the

keyboard so that the keyboard has a reduced size and is easily carried.

While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood  
5 that the invention is not limited to the disclosed embodiments.  
To the contrary, it is intended to cover various modifications and similar arrangements (as would be apparent to those skilled in the art). Therefore, the scope of the appended claims should  
be accorded the broadest interpretation so as to encompass all  
10 such modifications and similar arrangements.

**What Is Claimed Is:**

1           1. A collapsible keyboard, including:  
2           a base comprising a plurality of keyboard-base sections;  
3           at least one hinge, connecting the keyboard-base sections  
4           so that the keyboard-base sections are rotatable toward each  
5           other;

6           a keyboard comprising a plurality of key-base sections,  
7           provided on the keyboard-base sections, respectively;

8           at least one fixed hinge, connected to the key-base  
9           sections so that the first keyboard-base section and the second  
10          key-base section are rotatable toward each other;

11          at least one movable hinge, connected to one of the  
12          keyboard-base sections and one of the key-base sections; and

13          a plurality of keys mounted on the key-base sections.

1           2. A collapsible keyboard as claimed in claim 1, wherein  
2           the fixed hinge includes a pivot and two connecting rods, and  
3           the key-base sections are connected to the pivot via the  
4           connecting rods.

1           3. A collapsible keyboard as claimed in claim 1, wherein  
2           one of the keyboard-base sections defines a groove to contain  
3           the movable hinge.

1           4. A collapsible keyboard, including:  
2           a base comprising a plurality of keyboard-base sections;  
3           at least one hinge, connecting the keyboard-base sections  
4           so that the keyboard-base sections are rotatable toward each  
5           other;

6 a keyboard comprising a plurality of key-base sections,  
7 provided on the keyboard-base sections, respectively;

8 at least one first movable hinge, connected to one of the  
9 keyboard-base sections and one of the key-base sections so that  
10 the keyboard-base sections are rotatable toward each other;

11 at least one second movable hinge, connected to one of the  
12 keyboard-base sections and one of the key-base sections; and

13 a plurality of keys mounted on the key-base sections.

1 5. A collapsible keyboard as claimed in claim 4, wherein  
2 the first movable hinge includes a connecting rod, a first pivot,  
3 and a second pivot, connected to two ends of the connecting rods,  
4 respectively, and one of the keyboard-base sections defines a  
5 first groove to contain the first pivot, and the second pivot  
6 is pivoted at one of the key-base sections.

1 6. A collapsible keyboard as claimed in claim 5, wherein  
2 the first pivot defines a gap so that the first pivot can be  
3 compressed.

1 7. A collapsible keyboard as claimed in claim 5, wherein  
2 the second pivot defines a gap so that the second pivot can be  
3 compressed.

1 8. A collapsible keyboard as claimed in claim 1, wherein  
2 one of the keyboard-base sections defines a second groove to  
3 contain the second movable hinge.

1 9. A collapsible keyboard, including:

2 a first keyboard-base section;

3           a second keyboard-base section rotatably connected to the  
4 first keyboard-base section so that the first and second  
5 keyboard-base sections are rotatable toward each other;

6           a first key-base section provided on the first  
7 keyboard-base section;

8           a second key-base section separably provided on the second  
9 keyboard-base section and rotatably connected to the first  
10 keyboard-base section so that the first keyboard-base section  
11 and the second key-base section are rotatable toward each other;  
12 and

13           a plurality of keys mounted on the first and second key-base  
14 sections.

1           10. A collapsible keyboard as claimed in claim 9, further  
2 including a fixed hinge by which the first keyboard-base section  
3 and the second key-base section are connected together.

1           11. A collapsible keyboard as claimed in claim 9, wherein  
2 the fixed hinge includes a pivot and two connecting rods, and  
3 the first and second key-base sections are connected to the pivot  
4 via the connecting rods.

1           12. A collapsible keyboard as claimed in claim 9, further  
2 including a hinge by which the first and second key-base sections  
3 are connected together.

1           13. A collapsible keyboard as claimed in claim 12, wherein  
2 the hinge includes a first end connected to the first key-base  
3 section, a second end connected to the second key-base section,

4 and a connecting portion connected between the first end and the  
5 second end.

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1 14. A collapsible keyboard as claimed in claim 9, further  
2 including a movable hinge connecting the second key-base section  
3 and the second keyboard-base section, and the second  
4 keyboard-base section is moved by the second key-base section  
5 via the movable hinge when the first and second key-base sections  
6 are rotated toward each other.

1 15. A collapsible keyboard as claimed in claim 14, wherein  
2 the second keyboard-base section defines a groove to contain the  
3 movable hinge.

1 16. A collapsible keyboard, including:  
2 a first keyboard-base section;  
3 a second keyboard-base section rotatably connected to the  
4 first keyboard-base section so that the first and second  
5 keyboard-base sections are rotatable toward each other;  
6 a first key-base section provided on the first  
7 keyboard-base section;  
8 a second key-base section rotatably connected to the first  
9 key-base section so that the first and second key-base sections  
10 are rotatable toward each other, wherein the second key-base  
11 section is detachably provided on the second keyboard-base  
12 section; and  
13 a plurality of keys mounted on the first and second key-base  
14 sections.

1           17. A collapsible keyboard as claimed in claim 16, further  
2 including a first movable hinge by which the first and second  
3 key-base sections are connected together.

1           18. A collapsible keyboard as claimed in claim 17, wherein  
2 the fixed hinge includes a first end, a second end, and a  
3 connecting rod, and the first end is rotatably and slidably  
4 connected to the first key-base section, and the second end is  
5 pivoted at the second key-base section.

1           19. A collapsible keyboard as claimed in claim 18, further  
2 the first key-base section defines a groove to contain the first  
3 end.

1           20. A collapsible keyboard as claimed in claim 18, wherein  
2 the first end of the movable hinge includes a pivot, and the pivot  
3 defines a gap so that the pivot can be compressed.

1           21. A collapsible keyboard as claimed in claim 18, wherein  
2 the second end of the movable hinge includes a pivot, and the  
3 pivot defines a gap so that the pivot can be compressed.

1           22. A collapsible keyboard as claimed in claim 16, further  
2 including a movable hinge by which the second keyboard-base  
3 section and the second key-base section are connected together,  
4 wherein the second keyboard-base section is moved by the second  
5 key-base section via the movable hinge when the second key-base  
6 section and the first keyboard-base section are rotated toward  
7 each other.



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1           23. A collapsible keyboard as claimed in claim 22, wherein  
2   the second keyboard-base section defines a second groove to  
3   contain the second movable hinge.

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